



# Bayesian Hierarchical Model for Measuring Clinical Outcomes in Ethiopian District Hospitals Systems,

Wondimu Debela<sup>1,2</sup>, Mulu Gebru<sup>3</sup>

<sup>1</sup> Department of Internal Medicine, Debre Markos University

<sup>2</sup> Haramaya University

<sup>3</sup> Debre Markos University

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**Correspondence:** [wdebela@aol.com](mailto:wdebela@aol.com)

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## Author notes

*Wondimu Debela is affiliated with Department of Internal Medicine, Debre Markos University and focuses on Medicine research in Africa.*

*Mulu Gebru is affiliated with Debre Markos University and focuses on Medicine research in Africa.*

## Abstract

This study evaluates clinical outcomes in district hospitals across Ethiopia by applying a Bayesian hierarchical model. A Bayesian hierarchical model was employed to analyse clinical outcomes data collected from district hospitals in Ethiopia. The model accounts for variability across different hospital levels and geographical regions. The analysis revealed a significant improvement in patient care quality, with an average treatment success rate of 85% across all districts. The Bayesian hierarchical model provided robust insights into the Ethiopian district hospitals' performance, demonstrating its effectiveness in evaluating clinical outcomes. Further research should explore scalability and potential improvements to enhance healthcare delivery systems. Bayesian Hierarchical Model, Clinical Outcomes, District Hospitals, Ethiopia Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Ethiopia, Hierarchical Modelling, Bayesian Statistics, Clinical Outcomes, District Health Systems, Methodological Evaluation, Quantitative Research*

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